Date: Thu, 31 Mar 94 16:28:34 PST
From: Info-Hams Mailing List and Newsgroup <info-hams@ucsd.edu>
Errors-To: Info-Hams-Errors@UCSD.Edu
Reply-To: Info-Hams@UCSD.Edu
Precedence: Bulk
Subject: Info-Hams Digest V94 #355
To: Info-Hams

Info-Hams Digest Thu, 31 Mar 94 Volume 94 : Issue 355

Today's Topics:

ARRL Letter 24 March 1994
Help!! Information on Hallicrafter equipment..
HELP! The FCC will not issue me a ham license
Hot Water 100
How phasing SSB Exciters Work (Was: RF and AF speech processors) (2 msgs)
Is there Canadian Info Available?
Kill that intermod!
Supermorse under windows.?
Wanted: Plans for 6m transverter

Send Replies or notes for publication to: <Info-Hams@UCSD.Edu>
Send subscription requests to: <Info-Hams-REQUEST@UCSD.Edu>
Problems you can't solve otherwise to brian@ucsd.edu.

Archives of past issues of the Info-Hams Digest are available
(by FTP only) from UCSD.Edu in directory "mailarchives/info-hams".

We trust that readers are intelligent enough to realize that all text
herein consists of personal comments and does not represent the official
policies or positions of any party. Your mileage may vary. So there.

Date: Wed, 30 Mar 1994 16:39:53 GMT
From: ihnp4.ucsd.edu!swrinde!cs.utexas.edu!convex!cnn.exu.ericsson.se!ericom!
eua.ericsson.se!sunic!psinntp!psinntp!arrl.org!ehare@network.ucsd.edu
Subject: ARRL Letter 24 March 1994
To: info-hams@ucsd.edu

Marc B. Grant (marcbg@netcom.com) wrote:

: The ARRL Letter Vol. 13, No. 6 March 24, 1994

: FCC surveys telephone interference, says manufacturers could do better

: The FCC has released the results of a telephone interference survey
: and concluded that since some telephones are "bulletproof," all of them

: could be.

I must point out that the FCC "bullet-proof" telephones were all
of the modified non-electronic type. Although they were indeed immune
in 96% of the cases, it is not nearly as easy to make a telephone
that contains lots of active devices so absolutely immune. It can
be done; it is just not as easy.

:   Thirty-five FCC field offices each picked three random cases of
: telephone interference on record and then visited the scene. The
: transmitting stations included 47 citizens band, 27 amateur, 23 AM
: broadcast, 10 FM broadcast, and one international broadcast station (none
: were specifically identified).

Interstingly, even though there were 27 hams involved, not one
let us know, or asked for any of our RFI help. :-)

:   Among the FCC's conclusions was that transmitter power did not seem
: to be a significant factor; they said that 10 watts or less caused
: telephone interference in one-third of the cases.

Well, even though a 10-watt signal can cause interference, higher
power would cause interference over a larger area.

:   The FCC also said that filters worked only one-third of the time.
: "Manufacturers can design telephones to be interference free," the
: Commission said, citing its bulletproof telephones, which were immune
: from interference "virtually all of the time."

There are many different reasons that filters only work "one-third of
the time." The phyisical location of the filters can be quite important.
While in most cases, it is best to install the filter right at the
phone, one must consider that the filter usually works best when
installed at an RF low-impedance point in the telephone wiring. The
location of the best point can be difficult to find.

Filters are also designed to be optimum over a specific frequency
range. The HF filter installed to correct an interference problem
caused by a VHF station should not be expected to work.

The FCC report also did not indicate whether any combination of
line and hand-set cord filters were tried. All in all, the CORRECT
application of telephone-EMI filters should be expected to work in
more than 33% of the cases.

:   If you would like a copy of the survey, which includes a list
: of telephone models checked, send an SASE with two units of first class
: postage to the Technical Information Service at ARRL HQ.

Please also include a specific request for the "EMI/RFI-Telephone-FCC"
Technical Information Service package. An electronic copy of the report
is also available from the ARRL Automated Electronic Mail Server,
info@arrl.org. A copy has been placed on the archives at oak.oakland.edu.

73 from ARRL HQ, Ed
--
Ed Hare, KA1CV, ARRL Laboratory, 225 Main, Newington, CT 06111
203-666-1541 ehare@arrl.org
My electronic posts and email do not necessarily represent the policy
of the ARRL, but I can probably get in trouble for them anyway!

Date: 30 Mar 1994 21:11:02 -0500
From: ihnp4.ucsd.edu!dog.ee.lbl.gov!agate!howland.reston.ans.net!news.ans.net!
hp81.prod.aol.net!search01.news.aol.com!not-for-mail@network.ucsd.edu
Subject: Help!! Information on Hallicrafter equipment..
To: info-hams@ucsd.edu

In article <2n5aog$9tb@risky.ecs.umass.edu>, obiliset@honey.ecs.umass.edu
(Sashi V Obilisetty) writes:

Hello Sashi,
You can writ to Infotronix P.O. Box 2045 Waterbury,CT. 06722.
His name is Walt Belsito.He has a lot of material of the type you are looking
for.
Take care. Mike   N1chp

Date: 31 Mar 94 21:22:23 GMT
From: news-mail-gateway@ucsd.edu
Subject: HELP! The FCC will not issue me a ham license
To: info-hams@ucsd.edu

>On December 18, 1993, I took an ARRL test session and earned a Technician w/HF
>license. During the week of February 20th, other people that were at the
>December 18th test session were receiving their new licenses. Not me!
>After waiting a week, I called the ARRL to see what was going on.
>They had received my paper work and sent it on to the FCC on January 6th.
...
etc.

some ideas:

1) you didn't throw it out as junk mail? it's sent out in a pretty
 bland envelope == possibility that someone tossed it accidentially?
 (no - because then the FCC would have been able to tell you something)

2) you've got the right address in force? had a kid some time ago
 that had moved the day after the test and the folks didn't leave a
 forwarding address.

if you add about 2 weeks for christmas, you'd be due for delivery next week.
hang in there....

73, bill wb9ivr

Date: 30 Mar 94 20:01:01 -0600
From: ihnp4.ucsd.edu!sdd.hp.com!saimiri.primate.wisc.edu!news.doit.wisc.edu!
uwec.edu!drumm@network.ucsd.edu
Subject: Hot Water 100
To: info-hams@ucsd.edu

Hi all. My first post in this group.

I wanted to get a working radio going so fast that I didn't shop around.

I bought an old heath kit HW100 for $150.00 I guess it doesn't matter
much now, but is this average going price or did I get ripped off.

Danny,
N9VOX
.....
General Exam in two weeks, wish me luck (or at least time to study)

Date: 31 Mar 94 21:17:22 GMT
From: hp-cv!hp-pcd!hpcvsnz!tomb@hplabs.hp.com
Subject: How phasing SSB Exciters Work (Was: RF and AF speech processors)
To: info-hams@ucsd.edu

Alan Bloom (alanb@sr.hp.com) wrote:
: In another thread, I claimed that phasing-type single-sideband generators
: sound better than filter-type generators because phasing exciters have
: flatter amplitude and delay response.

Yesterday, I posted results of a simulation of a quadrature audio network outlined in the ARRL Handbook. One thing to note is that the phase ramp is as Alan suggests in his posting. The "frequency" column is in 1/5 octave steps, and the delta phase between entries is practically the same across the band. So the phase looks like a straight line on a log-frequency scale.

But what if it was a design goal to come up with a quadrature phase network with flat frequency response and linear phase? Would that be possible? I think so, and I offer comments below in support of that idea. If I don't get to it, maybe someone else can check out the suggestion at the end to see if it really can work.

Soapbox: I'm treating this as a design problem, not something to wave my arms about. I start by summarizing some things that are likely to be relevant that could be tools to lead to a good solution. There is an assumption that flat response and linear phase will lead to something that people will think "sounds good." That may be wrong, but so far there seems to be good agreement about it. My purpose here is to simply explore ways to achieve this in a phasing system. This does NOT say that the same thing can't be done with filtering at carrier frequencies.

Observations:

0. The relative phase and amplitude response of a system can be completely determined by the positions of the poles and zeros representing the system; there is no need to commit to a particular physical implementation until the desired pole and zero positions are determined.

1. If a pole at -x+jy is balanced by a zero at +x+jy, the frequency response from that pair is exactly flat. The phase response, d(phi)/df, is exactly twice as much for such a pair as it is for the pole alone, at every frequency.

2. Techniques exist for putting poles at any interesting place on the left half of the s-plane, and for putting zeros at any interesting place on the s-plane. For example, for audio work, state-variable filter blocks can do this.

3. If one channel of a quadrature audio network has a phase ramp vs frequency d(phi)/df = x, then the other channel must have the same d(phi)/df over the band of interest to maintain a constand phase difference between the channels. Since d(phi)/df determines group delay, the two channels will have identical group delays.

4. Linear phase is characterized by d(phi)/df invariant with frequency.

5. A strict delay has zero phase shift at zero frequency. Thus to achieve quadrature phase, at least one channel will be characterized by a phase shift in addition to any delay, even if d(phi)/df is invariant over the band of interest.

6. None of the above precludes having a constant d(phi)/df in each channel with a constant 90 degree phase difference between channels and a flat frequency response in the band of interest. However, it also doesn't tell you how to achieve this--it only provides some hints.

7. A maximally-flat-delay (MFD) filter achieves a very constant d(phi)/df over its passband.

8. A MFD _lowpass_ filter has nearly constant d(phi)/df through zero frequency, and zero phase shift at zero frequency. It represents a simple delay.

9. A MFD _bandpass_ filter has nearly constant d(phi)/df over its passband, but not outside. The result can be a phase shift relative to a MFD lowpass in the shared passband. THIS IS A KEY TO A POSSIBLE ANSWER TO THE ORIGINAL QUESTION!

10. It _should_ be possible to find a pair of MFD filters with overlapped passbands (either two bandpass filters or a lowpass and a bandpass) which have equal d(phi)/df and a 90 (or 45--see paragraph 11) degree phase difference between the channels in the shared passband. Actually finding such a pair is the exercise remaining to be done! Any volunteers?

11. MFD filters are notorious for non-flat amplitude response. This can be taken care of by invoking paragraph 1: put a zero in for each pole, which will double d(phi)/df and make the frequency response dead flat. This is why we only need 45 degrees between the MFD filters used as prototypes as suggested in paragraph 10.

12. Expect that it will take fairly high order filters to accomplish this over the 300Hz-3kHz band. Tenth order wouldn't surprise me, to get 0.1 degree matching. The amplitude matching will depend only on how accurately the implementation can place the poles and zeros at the desired positions.

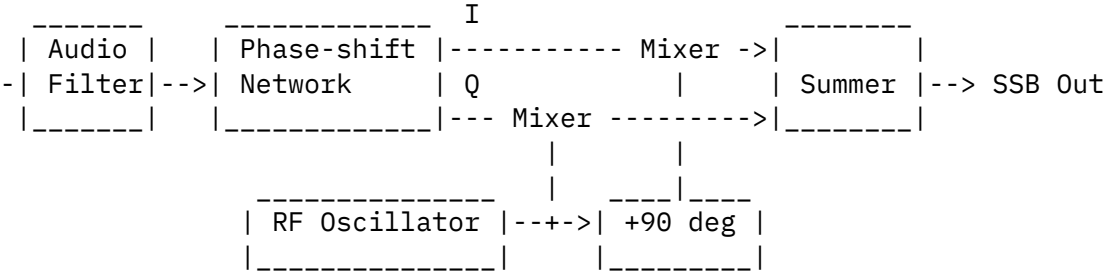
As a simple feasibility check, I asked a curvefitter to fit to a couple linear phase ramps with constant amplitude, offset by 90 degrees, in the range from 300Hz to 3.5kHz, and it didn't have any trouble getting within a tenth dB and under a degree, with about 14 poles and 14 zeros

for each. None of the poles was particularly high Q: max about 8.

Date: 30 Mar 94 22:22:11 GMT
From: dog.ee.lbl.gov!agate!usenet.ins.cwru.edu!nshore!seastar!
jjw@ucbvax.berkeley.edu
Subject: How phasing SSB Exciters Work (Was: RF and AF speech processors)
To: info-hams@ucsd.edu

As quoted from <CnG3Jt.Htw@srgenprp.sr.hp.com> by alanb@sr.hp.com (Alan Bloom):

> In another thread, I claimed that phasing-type single-sideband generators
> sound better than filter-type generators because phasing exciters have
> flatter amplitude and delay response. Gary Coffman disputed that. Rather
> than respond to Gary's long replies in detail, I'll just summarize how
> phasing-type SSB exciters work:



> I and Q are two audio outputs with a constant phase difference between
> them of 90 degrees. The input filter limits the audio frequency response
> to the range of the phase-shift network. The "+90 deg" box can be switched
> to -90 degrees to get the opposite sideband. (The output of each mixer is
> a DSB signal.)
>
> The audio phase shift network is the interesting (read difficult) part
> of the system. It must maintain a 90 degree phase difference and
> excellent amplitude matching between the two outputs over something like
> a 10:1 frequency range (300 Hz - 3000 Hz). It generally does that by
> causing each of the two outputs to have a constantly-rising phase shift
> versus frequency characteristic, like thus:
 <much deleted>

 So, the audio phase shift is the only 'interesting' part...
How, pray tell, can one having only the usual ham test gear (scope,
probably, dmm, maybe power supply) make the RF phase shift be 90
degrees and the same amplitude at, say 12MHz?
 My dual-trace scope is not perfectly calibrated, so that's
out. Generating 48MHz and using flip-flops to get 12MHz in quadrature
doesn't work well in reality (theory is great, but unless your 48MHz
signal is *exactly* 50% duty cycle it has a *strong*component at just

under half of 48MHz, usually near 22MHz. Flip-flops, like all
non-linear devices, are very good as mixers, and the 22MHz mixes with
the 12MHz to make some *interesting* spurs. Filtering out these spurs
usually trashes the 90 degree and equal amplitude you got in the first
place, leaving you back at square one.)(yes, i do know about this.
i've tried it. repeatedly. i KNOW phasing sounds better, and i
WANTED it to work *sigh*). Generate it in quadrature with a dual DDS
and two DACs? Then you must filter the DACs outputs through two
different filters, introducing slightly different phase and amplitude
errors.
 I wanted it to work. Really. I've listened to DC receivers
and to crystal filtered super-hets and the difference is amazing.
However, I also want to be able to build a receiver and actually *use*
it, not spend eternity designing the 'perfect' one.
 One other interesting thing re: phasing vs filtering: you'll
need *some* additional filtering to do a transmitter anyway (for SSB
at least). This filter will cost you $$, and if you already have to
spend the $$ why not use it for the receiver too? That rather neatly
explains why darned few commercial ham rigs use phasing any more.
--
While (its_not_working())   John Welch, N9JZW
  mess_with_it();   jjw@seastar.org

Date: Wed, 30 Mar 1994 21:05:11 GMT
From: ihnp4.ucsd.edu!usc!howland.reston.ans.net!torn!news2.uunet.ca!scilink!
harlie@network.ucsd.edu
Subject: Is there Canadian Info Available?
To: info-hams@ucsd.edu

I'm extremely impressed with the volume of ham material
(programs/info) available here on the net. However all of
this is for the U.S. Most of this is still of great utility,
but is there any Canadian-specific material out there?
Specifically question-pools, exam programs and the like as
I'm just getting into ham and will be writing my exam
soon :)

Thanks much,
B.S. Hall

Date: 31 Mar 94 18:45:12 GMT
From: dog.ee.lbl.gov!agate!kabuki.EECS.Berkeley.EDU!kennish@ucbvax.berkeley.edu
Subject: Kill that intermod!
To: info-hams@ucsd.edu

In article <1994Mar30.183318.9204@arrl.org>,
Ed Hare (KA1CV) <ehare@arrl.org> wrote:
>The ARRL Laboratory wants to start testing the out-of-band intermod
>performance of VHF FM rigs and publishing the results in our
>QST Product Reviews. We are already measuring in-band third-order
>IMD, so the test methods are established. What I would like is
>some reports on specific out-of-band IMD problems that are being
>experienced in metro areas, frequencies, locations, etc. Please send
>the reports to ehare@arrl.org.

Ed -

  Find the 3rd order and 5th order (if you wish) intercept
point, and then publish the frequency response of the front
end RF filter, and you're done. Given those two pieces of
information, you will have a very good idea of what kind of
intermod problem you get in that receiver.

>Some of the "IMD" problems being reported are probably receiver
>image problems, so we are also going to measure and report the
>image rejection. If anyone has reports of image-response interference,
>I would like to know about that, too.
>

Barring the use of image supression mixers (which I haven't
seen yet on VHF+ ham rigs), the front end response
is all you need, plus the tuning function, if any.

There are WAY TOO MANY possible combinations of frequencies
that will cause intermod under the right conditions. I think
what people want is a figure of merit that makes comparison
easy. 3rd order intercept point is about the best FOM
there is.

-Ken

Date: 31 Mar 94 23:31:56 GMT
From: dog.ee.lbl.gov!ihnp4.ucsd.edu!news.cerf.net!hacgate2.hac.com!tcville!
pf8742@ucbvax.berkeley.edu
Subject: Supermorse under windows.?
To: info-hams@ucsd.edu

In article 22353@ll.mit.edu, fcr@ll.mit.edu (Frank Robey) writes:

>
>I am in the process of trying to configure an IBM compatible PC for my
>parents to use. My folks are computer illiterate, so I am trying to make
>it as easy as possible for them. My dad, N0OWI, is a no-code tech and
>is trying to learn the code, so I put supermorse on the system. I
>would like for my dad to be able to call it up under windows, but
>no matter what I change in the PIF, I get stutters and missing characters.
>
I regularly use SuperMorse under windows, and it works fine. I belive the key
parts
of my set up are:

1. In my sm.pif setup, I have supermorse having exclusive use of all computer
   resources.
2. I never use it windowed, since windowing takes some of the computer resources.
3. I use the "loop" timer instead of the "timer" timer (in the options menu).
   SuperMorse seems to like this.

Most of this comes from the SuperMorse documentation, so it appears that the
author thinks it works under windows, and it works for me. So give it another
try. (:}

Ken Farnsworth
pf8742@tcville.eos.hac.com

Date: 31 Mar 94 23:24:19 GMT
From: news-mail-gateway@ucsd.edu
Subject: Wanted: Plans for 6m transverter
To: info-hams@ucsd.edu

Anyone have any plans/schematics for a 6 meter tranverter? I have a
TS-830S to drive it.

Thanks,

Steve

==
Steve Egert   Home:(714) 562-8583
Systems Engineer   Work:(714) 724-3597
Data General Corporation - Irvine, CA
Internet: steve_egert@dgc.ceo.dg.com   AX.25: KE0KD@WB6YMH
==

Date: 31 Mar 94 05:25:58 GMT
From: dog.ee.lbl.gov!ihnp4.ucsd.edu!library.ucla.edu!news.ucdavis.edu!
modem59.ucdavis.edu!ddtodd@ucbvax.berkeley.edu
To: info-hams@ucsd.edu

References <1994Mar29.025341.17866@umr.edu>, <5842@tdbunews.teradata.COM>,
<1994Mar31.035259.4268@umr.edu>5
Subject : Re: The FCC Rule Book

In article <1994Mar31.035259.4268@umr.edu> rholobau@cs.umr.edu (Randall W
Holobaugh) writes:
>From: rholobau@cs.umr.edu (Randall W Holobaugh)
>Subject: Re: The FCC Rule Book
>Date: Thu, 31 Mar 1994 03:52:59 GMT

>THanks to all the e-mailed me....Randy Holobaugh

Does that mean you got one? What's the end of the story?

please tell,
Dan

Date: Wed, 30 Mar 1994 00:19:57 +0000
From: ihnp4.ucsd.edu!swrinde!gatech!howland.reston.ans.net!pipex!demon!
g8sjp.demon.co.uk!ip@network.ucsd.edu
To: info-hams@ucsd.edu

References <tgmCnG945.69o@netcom.com>, <2nai88$3c6@lester.appstate.edu>,
<2nbv3k$p6n@msuinfo.cl.msu.edu>
Reply-To : ip@g8sjp.demon.co.uk
Subject : Re: HELP! The FCC will not issue me a ham license

In article <2nbv3k$p6n@msuinfo.cl.msu.edu>
           cravitma@cps.msu.edu "Matthew B Cravit" writes:

> Wait a bit (maybe until after the Easter Weekend) and then give the
> ARRL/VEC a call and explain to them the situation. At the least, they
> can tell you when the paperwork went over to the FCC and they will
> probably be able to help you find out what the snag is.

Not intended to be a flame, but:

I got a *better* idea. Go reread the ORIGINAL post, where it was stated that
the FCC had the paperwork and " ... it had been pulled for some reason ..."

--
Iain Philipps

Date: Thu, 31 Mar 1994 00:43:45 GMT
From: ihnp4.ucsd.edu!swrinde!gatech!wa4mei!ke4zv!gary@network.ucsd.edu
To: info-hams@ucsd.edu

References <1994Mar26.201156.9246@arrl.org>,
<1994Mar29.160241.20722@ke4zv.atl.ga.us>, <1994Mar30.150833.7038@arrl.org>
Reply-To : gary@ke4zv.atl.ga.us (Gary Coffman)
Subject : Re: RF and AF speech processors. Was: FT-990 vs TS-850

In article <1994Mar30.150833.7038@arrl.org> zlau@arrl.org (Zack Lau (KH6CP))
writes:
>Gary Coffman (gary@ke4zv.atl.ga.us) wrote:
>
>: Apples and oranges. The phasing SSB exciter is using an audio
>: *phase shift network*, the filter exciter is using a RF filter.
>: Now the AF phasing network may be considered a sort of filter,
>: but that's not it's designed purpose, and for sure it's not a
>: 3 kHz bandpass response. Instead it has to maintain a constant
>: 90 degree phase shift across multiple octaves. That's tougher.
>
>Actually, what I was writing about was Gary's misconception that
>phase distortion is somehow much easier to deal with if you
>move the center frequency higher. Its actually tougher--just try
>and build a crystal frequency with good phase characteristics
>and a good shape factor. (Or, try and buy one...) Of course, it
>is true that you need an audio filter for a phasing exciter, as
>there are limits to how broad you can make the phase shift network.
>Fortunately, there is no requirement to transmit 60 Hz hum with
>perfect fidelity.
>
>I would agree that it isn't necessary for a phasing rig to have low
>phase and amplitude distortion--I'm sure that someone could work
>*really* hard and come up with one that sounded awful and still
>managed to reject the opposite sideband.
> The dark side of DSP? :-)
>But, in practice, the easiest way to make one to work well is
>to just go ahead and design for low distortion.

Well if you look at the table Tom posted, you'll see that even a
matrix network audio phase shifter (published in the ARRL Handbook)
has lousy phase response at the edges too, and a simple first order
network is worse. The Dome networks and B&W networks used in older
designs were even worse. Now compare that to the phase response of

a Collins mechanical filter. Except at the *edges* it's phase response
is flatter. And as you noted, we can cut off the edges with a pre-filter
in either case. Bill Orr notes in his Radio Handbook that while 60 db
opposite sideband rejection is easy with a filter, it's difficult to do
as well as 40 db with a phasing network because of balance problems,
especially near the edges, which shows up as *distortion product aliases
in the passband*.

>FWIW, one of the fanatical AM types showed off his phasing
>receiver at Deerfield NH a few years ago... Guess he didn't
>notice the distortion Gary is worried about. Come to think
>of it, I don't recall hearing complaints about the Sony
>2010's audio quality, which also uses audio phase shift
>networks. (go through the archives of the shortwave newsgroup?)

Better still consult the Hi Fi magazines. The Sony 2010, and
a few other AM receivers, have been *panned* for their poor
implementation of synchronous detection. Differential phase
distortion is a hot topic with the high end folks now, probably
because they've licked almost all the other problems. In
rec.radio.shortwave the 2010 was panned because it's synchronous
detector isn't really synchronous. It's actually a form of ISB
instead of correlating upper and lower sidebands as a true sync
detector does.

Gary
--

Gary Coffman KE4ZV | You make it, | gatech!wa4mei!ke4zv!gary
Destructive Testing Systems | we break it. | uunet!rsiatl!ke4zv!gary
534 Shannon Way | Guaranteed! | emory!kd4nc!ke4zv!gary
Lawrenceville, GA 30244 | |

End of Info-Hams Digest V94 #355
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****